

IN THE SPECIFICATION:

Please amend the paragraphs starting at page 1, line 6, and ending at line 26, as follows.

--The present invention relates to a print operation processing device for a serial printer such as an ink-jet printer and the like to execute a cycle of operation for supplying, printing and ejecting a discrete paper or to repeat the above-mentioned operation for continuous printing on discrete papers where the succeeding paper is overlapped at a desired position of the current paper in accordance with a printing area of the current paper so as to execute a successive printing effectively for raising a throughput of the printing, by saving ejecting time for blank ~~area~~ areas of the current paper.

2. Brief Description of the Related Art

The print operation processing device mentioned above has a function to execute a successive printing on a plurality of discrete papers. ~~Usually~~ Typically, the print operation for the discrete paper consists of paper supply, printing and paper ejecting procedures etc.[[.]] When [[a]] successive printing on a plurality of discrete papers ~~are~~ is required, the requirements are fulfilled by the conventional systems when the above-mentioned cycle of a print operation on the discrete paper is repeated.--

Please amend the paragraph starting at page 2, line 8, and ending at line 15, as follows.

--In the above-mentioned conventional ~~ordinary~~ print operation processing devices, the print operation for each paper is completely independent. Though some printers attain

ejecting the current paper and supplying the succeeding paper simultaneously, operations are executed routinely regardless of the area size to be printed and without overlapping papers. Consequently, total throughputs of the print operations are insufficient.--

Please amend the paragraphs starting at page 3, line 3, and ending at page 4, line 7, as follows.

--~~Usually~~ Typically, when data with different contents for each paper are printed continuously on discrete papers, a series of print operations are executed according to the following sequence as shown in FIG.2, which is explained later. The printing sequence comprises (1) paper supply, (2) repeat operations of printing in the main scanning direction and paper feed in the sub scanning direction, (3) paper ejection when no data to be printed remain for the current paper or when the current paper passes the lower margin.

As mentioned above, a plurality of the same printings on discrete papers are executed in the same way as described above. In these printings, a time for printing is determined by a time for printing in the main scanning direction, a time for paper feeding in the sub direction and a time for paper ejection/supply. ~~Which~~ This affects and determines the maximum throughput of the print operation processing device.

SUMMARY OF THE INVENTION

The present invention is carried out in view of the above-mentioned problems. The objective of the present invention is to provide a print operation processing device capable of improving the total printing throughput by a function of the device to supply the

succeeding paper even when the current paper is in a supplied ~~state, once~~ state. Once a termination of the printing on the current paper is confirmed by parameters from a host computer or by monitoring paper feeding amount of the current paper in the printer, so as to feed paper effectively in a partially overlapped state with the succeeding paper without changing the printing velocity in the main scanning direction and the paper feeding velocity in the sub scanning direction.--

Please amend the paragraphs starting at page 4, line 11, and ending at page 6, line 11, as follows.

--(1) A print processing device equipped in a serial printer comprising[[;]]: an analyzing unit to analyze a printing command from an apparatus which transmits printing data, a storing area to store an analyzed result by the analyzing unit, a controlling unit to identify stored contents in the storing area and to control a paper feeding device, wherein[[;]] the controlling unit functions to supply a succeeding paper so as to overlap to a current paper after detecting a lower margin of the current paper after detecting a lower margin of the current paper according to the analyzed result stored in the storing area.

(2) The print processing device equipped in the serial printer according to (1), wherein[[;]] the controlling unit detects a blank area in the current paper as the lower margin of the current paper.

(3) The print processing device equipped in the serial printer according to (2), wherein[[;]] the controlling unit detects a blank area according to information on a printing area before a host computer transmits the printing data.

(4) The print processing device equipped in the serial printer according to (3), wherein[[;]] the detecting function to detect the blank area is activated or deactivated by the host computer or by the printer, and the controlling unit has a setting means to overlap the succeeding paper to the lower margin of the current paper when the detecting function is deactivated in a discrete paper printing.

(5) The print processing device equipped in the serial printer according to (4), wherein[[;]] the setting means is capable of setting a condition where papers are supplied without an overlapped state.

(6) The print processing device equipped in the serial printer according to (1), wherein[[;]] the controlling unit supplies the succeeding paper at any timing before ejecting the current paper, and when the paper supply is at an incapable timing due to structural factors of said paper supplying device the succeeding paper is reserved until the timing returns to the capable timing of the paper supply.

(7) The print processing device equipped in the serial printer according to (1), wherein[[;]] the storing area to store the analyzed result has a storing portion to store a supplying state of the paper, and the controlling unit has a controlling function to write and to read parameters in the storing portion to store the supplying state during the supplying or ejecting operation of the paper.

(8) A print processing method for a serial printer comprising operations of[[;]]: analyzing a printing command from a device which transmits printing data by an analyzing function arranged in the printer, storing an analyzed result by ~~said~~ the analyzing function in a storing area arranged in the printer, identifying contents in the storing area and

controlling a paper feeding device by a controlling unit arranged in the printer, wherein[[:]] the controlling unit functions to supply a succeeding paper so as to overlap to a current paper after detecting a lower margin of the current paper according to the analyzed result stored in the storing area.--

Please amend the paragraphs starting at page 6, line 25, and ending at page 7, line 16, as follows.

--Hereinafter one of the embodiment of the present invention is described in detail by referring to the drawings.

The main arrangement of the serial printer of the present embodiment is shown in FIG. 3. This arrangement is not limited in its specifications, it is applicable to all serial printers having functions described above.

~~A numeric~~ Numeric character 1 is a serial printer, [[a]] numeric character 2 is a data receiving unit, [[a]] numeric character 3 is a data analyzing unit, [[a]] numeric character 4 is a print operating unit, [[a]] numeric character 5 is a paper feed operating unit and [[a]] numeric character 6 is a host computer for transmitting data to be printed to the printer 1.

FIG. 2 is the flow chart depicting a fundamental operating sequence of the printer 1 operated by commands from the host computer. A timing for a first paper supply is ~~depend~~ dependent on a characteristic of the printer and specifications for analyzing printing commands, but it is not a significant point in the present invention so that ~~the~~ a further explanation on the timing is omitted.--

Please amend the paragraphs starting at page 8, line 22, and ending at page 9, line 18, as follows.

--At step S1₁, the data receiving unit 2 (FIG. 3) reads data from the host computer 6 (FIG. 3). At step S2₁, the data are analyzed by the data analyzing unit 3 (FIG. 3) and the data are stored in a storage area for the analyzed results (not shown). When the data include other commands except the command to eject the paper, the printing procedure returns to step S1. When the printer receives the command to eject the paper, the printer controls paper feed in accordance with the stored data. At step S3, “Analyzing Parameter”, the data analyzing unit (FIG. 3) judges whether the parameter in the command to eject the paper indicates data for printing remain or not. When the parameter indicates no data for printing remain, the print operation is finished after ejecting the paper (step S6).

At step S3₁, when the parameter indicates the data for printing still remain, the print operation goes to step S4₁, where paper ejecting conditions in an inputting device (not shown) arranged in the printer for changing paper feeding conditions and in a storage area (not shown) inputted via the inputting device are confirmed. If the paper supply is allowed, the print operation goes to step S5 where overlapping supply of paper is executed. If not, the print operation goes to step S7 where the paper is ejected and goes to step S8 for discrete supply of the paper.--

Please amend the paragraph starting at page 10, line 4, and ending at line 20, as follows.

--In the procedure to confirm the supply of the succeeding paper, the current medium is confirmed and it is judged whether the overlapping supply is allowed or not (step S4). More specifically, specifications and functions of the current printer, and properties of the current medium are checked for whether the overlapping supply is allowed or not. If not, the ordinary paper ejection (step S7) is executed without executing the overlapping supply. Even when conditions allow the overlapping supply, but when an overlapping position is determined by the structure of the printer, the supply of the succeeding paper is reserved until the current paper reaches a position where the overlapping supply is possible. In other words, even when it is judged that the paper supply is allowed, but actually it is not allowed due to the structure of the printer, the papers are accumulated until the printer returns to a state where the paper supply is allowable.--

Please amend the paragraph starting at page 10, line 26, and ending at page 11, line 5, as follows.

--A case when more than two sheets of the paper are overlapped owing to areas to be printed of respective papers, is also allowed, if conditions such as an accuracy of a paper supplying structure, etc. are fulfilled. If the number of ~~the paper~~ papers to be overlapped is limited due to the accuracy, the supply of the succeeding paper is reserved according to the above-mentioned function until conditions are fulfilled.--

Please amend the paragraph starting at page 11, line 13, and ending at line 21, as follows.

--Usually the print operation processing device represented by the serial printer has its proper printing margins in the main and sub scanning directions. In this case, only areas where the printing is not allowed (the lower end margin) may be overlapped by the above-mentioned means without detecting the above-mentioned lower margin or a blank area in the paper. In this case, a function to activate/deactivate detecting the lower margin and the blank area should be preferably arranged in the host computer or the printer.--

Please amend the paragraph starting at page 12, line 3, and ending at line 9, as follows.

--Since these setting means can be set by the host computer or the above-mentioned inputting device of the printer, it is not necessary to specify a type of the host computer. Though conveying efficiencies of the paper are different ~~depend~~ depending on specifications of printers, more efficient paper conveyance may be attained by the present invention than by the conventional systems.--